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From the London Quarterly

Eastern Archipelago.

(Continued from page 324.)

In commercial importance, although not in size the island of JAVA ranks first in the Oriental Archipelago. The country to which it bears the nearest resemblance in beauty of aspect is perhaps Italy, and it must always possess an interest for England, as she ruled it for six years. It received from her an improved revenue system; and an impulse was communicated to industry, which was beginning to produce great results, when, by the arrangements of the peace of 1815, the island was restored to Holland. The name of Sir Stamford Raffles, its Governor, is still pronounced with reverence in Java by many who knew him in their youth. The area of Java is rather less than that of England and Wales, and its length is somewhat greater than that of England and Scotland. Its breadth varies from 56 to 136 miles, therefore no part of its interior is very distant from the sea. The population is rapidly increasing, and has doubled itself in twenty years. It is irregularly distributed, and more than half of the cultivable surface is uninhabited. The faith of the entire people is now Mahomedan.

Java is traversed from east to west by a chain of mountains, which are nearest to its southern shore. The island is probably of volcanic origin, the great Asiatic chain which extends down the Malay Peninsula terminating there. It possesses, like other volcanic countries, neither iron nor gold. The fertility of its soil is extraordinary: the island is therefore eminently an agricultural one. The heat of the coasts is great, but frost is not uncommon on the mountains. The capital is unfavourably situated in the midst of a pestilential swamp; but the mortality, which is inevitable from its position, is probably compensated, in the opinion of the Dutch Government, by the difficulty of the approach and by its security. The flora of Java is varied and magnificent; but as few of the plants are deciduous, the country presents always nearly the same appearance, being clothed with a brilliant and unchanging verdure. The vegetation struck Sir Stamford Raffles when he first visited the island as 'fearful.' Mountains 10,000 feet high are cultivated half way to their summits. On the coasts palms and bananas conceal the marshes and jungles from which they spring. Rising gradually, the country then assumes a more varied surface, and at the height of 1000 feet, ferns preponderate with a thick growth of bamboo. To these succeed forests of tall and spreading fig-trees; ferns then increase in size; orchideous plants of rare beauty are intermingled with the exuberant vegetation, and fig-trees are succeeded by the oak and the laurel. In the region above, the trees are dwarfed, their tropical character disappears, and heaths and coniferæ, with cryptogamous plants, abound. The ferns then become diminutive, and mosses and lichens denote an almost alpine temperature. With a range of climate between the tropical and the temperate zones, Java produces all the fruits and cereals of Europe and Asia. The vegetable wealth of the island is therefore immense. Six zones exist, each of which yields in rich abundance its peculiar productions. Rice, maize, cotton, coffee, sugar, tobacco, indigo, pepper, the cocoa-nut, bread-fruit, sago, wheat, the potato, and almost every other European vegetable thrive luxuriantly. Fruits of exquisite flavour abound, and flowers of unimaginable beauty load the atmosphere with perfumes.

> 'Whatever fruits in different climes are found,
> That proudly rise or humbly court the ground;
> Whatever blooms in torrid zones appear,
> Whose bright succession decks the varied year;
> Whatever sweets salute the northern sky,
> With vernal lives that blossom but to die;
> These, here disporting, own the kindred soil,
> Nor ask luxuriance from the planter's toil;
> While sea-borne gales their gentle wings expand,
> To scatter fragrance round the smiling land.'

The Dutch first formed a settlement in Java in 1611. The progress of their ascendency has resembled that of other nations placed under similar circumstances. European influence was at first opposed, then gradually and firmly established, and native kingdoms were ultimately converted into subordinate and dependent states. The native government was an hereditary despotism, and the sovereign was addressed in the highest style of Oriental flattery. He became, under the rule of the old Netherlands East India Company, as mere a shadow of royalty as the Great Mogul. The court of the nominal prince was permitted to retain its national customs; and the royal palace, although lying immediately under the guns of a small Dutch fort, was denominated the habitation of the Sun.

The Dutch East Indies were for two hundred years administered by a company of merchants, subject to the control of the States-General. There was therefore a considerable resemblance between the Dutch and English East India Companies in their constitution and privileges.

When Holland succumbed to the yoke of revolutionary France, Java necessarily fell with it. Napoleon probably attached little value to the acquisition, regarding it at first only as a dilapidated possession of an old spendthrift corporation. In one point of view, however, it appeared to him of great importance. It might be made a base of operations for his meditated conquest of the British possessions in the east. These intentions were anticipated by the capture of the island in 1811, and Java, for two hundred years the seat of Dutch empire in the Eastern Archipelago, became a British dependency.

The Dutch shook off the French yoke, and became again a nation. The Netherlands were reconstituted as a limited monarchy; and by the Treaty of London in 1814, all the transmarine possessions of Holland which had been captured by England were restored, except the Cape of Good Hope.

Holland, as a state of any European consequence, now depends upon the maintenance of its empire in the Eastern Archipelago. The system on which it relies for augmenting its revenue has been very carefully described in the work of — Money. It certainly presents a remarkable picture of successful administration, wherein the Dutch Government fills the several characters of a landowner, cultivator, trader, and ruler. By means of those offices combined it has made Java the chief source of the present financial prosperity of the Netherlands, and has derived from it the means for paying off a large portion of the national debt, providing compensation to the holders of slaves in the West Indies, and expending ten millions of florins annually upon railroads. On the restoration of Java to its old masters, trade had flowed into new channels, and the land-tax was the only existing substitute for the old Dutch monopolies. The government is considered the supreme lord and absolute proprietor of the soil. The ancient rent of land was one-fifth of the produce, and one-fifth of the labour of the occupier of the soil. A system denominated the culture system was introduced in 1830. It may be briefly described as a return to the old plan of forced deliveries of agricultural produce, combined with compulsory labour. Under this arrangement a portion of the land-tax is remitted, and some of the best land, together with the labour of its peasantry, is appropriated to the cultivation of produce deemed peculiarly fitted for the European market. The profits are divided between the grower, the manufacturer, and the government. Into the complicated details of this system, it is impossible here to enter. It rests upon the supposed sovereign right of disposing of the labour of the natives, and upon their obligation to cede one-fifth of the produce of their occupied land to the government. The labour of the people, although compulsory, is not, however, entirely without remuneration. Sugar, indigo, cochineal, tea, tobacco, coffee, cinnamon and pepper, are raised by native labour, with or without the intervention of a European contractor. The government thus receives from the crown-lands from 60,000 to 70,000 tons of coffee, with large quantities of other valuable produce; the whole of which is consigned to Holland for sale.

The financial result of this system is highly satisfactory to the government of the Netherlands. The gross revenue from Java has risen from a former average of 24,000,000 of florins to 115,000,000. In 1859 it amounted to nearly 10,000,000*l.* sterling, and has been and is still steadily on the increase. The sum annually expended by the government in works of reproductive industry avera-

ges about 2,000,000*l.*, and is analogous to the judicious outlay of a landlord upon his estates. Whether this mode of 'managing a colony' is consistent with the higher functions of government may be questioned, although the material interests of the people have been considerably benefitted by it. The government believes that Java presents a field of almost indefinite financial prosperity, and is destined to restore to an old and decayed state a portion of its former commercial and political greatness. But although it may have conferred present prosperity on Java, and so far benefitted its people, the avowed policy of the Dutch Government is not to elevate the native race, but to keep them in a state of moral and intellectual bondage as a cheap and easy method of maintaining its supremacy.

Java is the entrepôt of the commerce of the Netherlands in India. Private trade between Holland and Java is now unrestricted. The Netherlands Trading Company is employed only as the agent of government, and possesses the exclusive privilege of carrying the produce of the crown-lands to Europe. The merely mercantile aspect in which alone Holland regards her fine dependency is certainly not consistent with our notions of government; and it may be doubted whether, if the State were to give up to private industry the vast estate which it now manages with so much skill and success, and apply itself to its more legitimate functions, even the financial success would not ultimately be as great as any that has hitherto been realized by an opposite system.

The Dutch administration of Java has its favourable aspects; but to make a distant people a source of mercantile profit by a system of forced labour and a studied disregard of their moral interests, is but a modification of slavery and a persistence in the nineteenth century in that exploded system which valued colonies only as subservient to the commercial aggrandisement of nations. The government of Java is carried on by native chiefs, termed Regents; but European officers, denominated Residents, have a controlling authority, and constitute, in effect, so many local centres of administration. The native aristocracy has thus been transformed into the salaried officers of government. The system is said to give satisfaction; the allowances of the native rulers being higher than those of the European residents.

(To be continued.)

From "Youthful Piety."

Daniel Bowly, Jr.

(Concluded from page 326.)

At another time he said, "Be religious, and then you will have our Saviour's arm to lean upon. Oh! he is a merciful Saviour! I have found him such; an easy Master, a kind Friend. Ah! how I regret that I neglected serving him for some years. Think what a superior education we have had, to most; what a nice institution is ours—the peculiar institution of God, and I believe it is not to die away, although some of our society have gone from it, for whom I am sorry."

"I believe great advantage may arise from frequently comparing time with eternity; an awful eternity! It appears to me exceedingly awful! Heaven and hell are placed before us. We have our choice; and we know what wretches hell is composed of—foul minds, full of remorse forever, for their worm never dieth. On the other hand, in heaven there is great harmony. Oh! I have had beautiful prospects! I have seen the innumerable company of angels, and the spirits of good men. But how is it? We are ashamed of not complying with man, and not ashamed of doing so to God. We can apologize to men, and say we are sorry we did not do so or so, and we can directly commit neglect before God, and feel no sorrow for it. Oh: what mercy there is! In great wisdom and unspeakable kindness is the good Mediator given, to reconcile us and work redemption in us. Do not let us fear man; what is he? Look upon *me* and see a poor weak thing that can hardly speak."

After this he was much exhausted, and desiring to be put to bed, uttered the following short ejaculation: "O Lord God Almighty, be thou pleased to look down upon, and be with us." It was with difficulty he got to bed, and for some hours his symptoms seemed to threaten dissolution, but after having slept some time he revived.

Cautioning some of his friends to beware of the incumbrances and fatigues of business, he observed. "It will not do for those who have been all the week in the hurry of business, to go to meeting and appear before the Lord in form only. A man whose time is wholly engrossed in business in common, [although] he goes to meeting pretty constantly, and sits there two hours, yet it is to be feared his thoughts will be engaged on that which takes up the greater part of his time; and if it be so, it is great mockery of God. Neither will it do to go in an outward show of dress and address, if not true worshippers of the Lord in spirit and in truth. They must daily give up their minds to him; daily retire to worship him. I know a man ought to provide for his family, and carry on a proper business, which I believe to be right, but it should by no means be the first object, for riches will be nothing in the end. What would I give now for all the world? Nothing at all."

The 12th of the Eighth month he said to one of his sisters, "How many times have I been preserved from death! times more than I can remember. Ah! how often, sister, have some of us been raised, as it were, from death. We should often think of it, and how we have answered the kind intention. It may not be so again. The next may be the last time. Then do let us begin to prepare and do everything that is required of us. I believe plainness of dress is. We are indeed a chosen people, and what may not be wrong in others is so in us. Plainness of dress is an hedge about us. The world is not then seeking our company. Do remember what our Saviour said, 'Whosoever denieth me before men, him will I also deny before my Father who is in heaven.'" After this he impressively said, "The enemy is still very busy with his insinuations, and would persuade me that all is done, and so lead to neglect, but I must watch and pray to the end, and be very earnest with the Almighty to continue his favours and that he will support me through all."

He was preserved in a state of humble, patient waiting, and expressed but little for some days, but the sweetness and solidity of his deportment evinced that his spirit was centred to the source of Divine life. On the 1st of Ninth month he remarked, "The state I expect to enter is that of calmness and peace, divine peace; the purest spirituality. I hope to live in the presence of God and to feel constant support from him, and I do not wish to know more." The following day he was very weak, and left his chamber with reluctance. Soon after, he was seized with so violent a fit of coughing, that the hour of his dissolution seemed near at hand. In a short respite from the paroxysms, he triumphantly said. "I am happy—I am happy—If I never speak more, give my dear love in Christ Jesus to all my friends." After getting into bed he remarked, "but I have full faith in my foundation."

At another time, "I believe my dear Saviour is ready to receive me into purity, and that is what all good minds desire to enter into." In the evening, some one remarking how hard it rained, he said, "I like to hear it—the sound of it is solemn—it is the work of the Almighty. The withdrawing of the sun, and darkness, is like what good souls experience in the work of redemption, when Divine light is withdrawn from them. In these seasons, what strange ideas is the mind tried with, such as are very apt to cast down the timid—but there is a sweet support sustains, though at such times not sensibly felt." On the 3rd, he seemed anxious to be gone, and prayed thus: "O Lord God Almighty! have pity upon me. It was thou who created both soul and body." Some time after, he said to a near friend, "I believe the enemy has now almost done with me."

On the 4th he was very weak, but calm and composed, remarking that he was going to the Father and the Son, and bade his Friends farewell. About twelve o'clock he took an affectionate leave of two cousins who waited on him, and his voice became so weak that little he said could be heard: the last sentence which was distinctly understood, proved as a seal to the foregoing truths, viz. "I have the satisfaction to say that I have been washed in Jordan." He put off mortality in the manner for which he had often prayed, without a groan or even a sigh, aged twenty-five years and eight months.

A Natural Curiosity.—A singular instance of the foresight of a field-mouse has just been brought under our cognizance. A person clearing the garden ground of Thomas Thomson, Dalkeith, Scotland, came upon a growing turnip, which he pulled up by the root. Guess his astonishment, when he found that the turnip was completely hollowed out, as neatly as if it had been done by the chisel of a carpenter, and the interior filled with large garden beans. The work, from the size of the hole whence the inside of the turnip had been extracted, was manifestly that of a mouse, and the object, no doubt, of filling the interior with beans, was to provide against hunger in the barren winter weather. Near the place where the turnip was growing, there were several stalks of beans, upon which some pods had been left, and it is supposed that the cute mouse had helped itself to these. We counted the beans in the turnip—a small one—and found that they amounted to no less than six dozen and two.—*Scottish Farmer.*

From "Silliman's Journal."

Colorado River of the West.

(Continued from page 327.)

"There was no appropriation that would enable the War Department to accomplish this service until the summer of 1857, when the present Secretary of War, having the disposition of a certain amount to be expended in field examinations, set apart a portion of it for the exploration of the Colorado, and directed me to organize an expedition for that object.

To ascertain how far the river was navigable for steamboats being the point of primary importance, it was necessary first to make provision for this portion of the work. The company employed in carrying freight from the head of the Gulf to Fort Yuma were unable to spare a boat for the use of the expedition, excepting for a compensation beyond the limits of the appropriation. A boat of suitable construction had, therefore, to be built on the Atlantic coast and transported to San Francisco, and thence to the mouth of the river. In order that the survey should be made at the worst and lowest stage of the water, I had been directed to commence operations at the mouth of the Colo-

rado on the first of December. This left little time for preparation, considering that it was necessary to build a steamer and carry the parts to so great a distance.

In the latter part of June, I ordered of Reaney, Neafie & Co., of Philadelphia, an iron steamer, fifty feet long, to be built in sections, and the parts to be so arranged that they could be transported by railroad, as the shortness of time required that it should be sent to California, *via* the Isthmus of Panama. About the middle of August the boat was finished, tried upon the Delaware, and found satisfactory, subject to a few alterations only. It was then taken apart, sent to New York, and shipped on board of the California steamer which sailed on the 20th of August for Aspinwall. A. J. Carroll, of Philadelphia, who had engaged to accompany the expedition as steamboat engineer, went out in charge of the boat.

The transportation of the steamer was, to the parties concerned, a source of more trouble than profit, but the kind offices of the agents of the Panama Railroad Company, and of the captains of the steamships on both the Atlantic and Pacific coasts, united to the careful supervision of Carroll, enabled the awkward mass of freight to reach San Francisco in safety by the first of October.

Dr. J. S. Newberry was appointed physician to the expedition, and also to take charge of the natural history department. This gentleman had previously made extensive geological surveys in California and Oregon while attached to the party of Lieutenant Williamson, topographical engineers, in charge of the Pacific railroad surveys in those regions."

The Journal of Lieut. Ives is full of interesting descriptions of incidents of the trip, accounts of numerous tribes of Indians, scarcely known prior to his visit, as the Moquis, Mojaves, &c. An important hydrographic report of 14 pages is also appended. We have room only for the vivid description of that remarkable passage in nature, the Black Cañon, given on pages 85, 86, and 87.

"*Camp* 59, *head of Black Cañon, March* 10. —The skiff having been put in tolerable order, a bucket full of corn and beans, three pairs of blankets, a compass, and a sextant, and a chronometer were stowed away in it, and a little before sunrise the captain, mate, and myself commenced the exploration of the canon. My companions each pulled a pair of sculls, and with considerable vigour; but as the current has a flow of three miles an hour we could not make rapid progress. We had proceeded a quarter of a mile, and had just rounded the first bend, when one of the sculls snapped, reducing by half our motive power. There was, fortunately, a current of air drawing in the right direction through the narrow gorge, and, with the odd scull and a blanket, an apology for a sail was rigged, which, at intervals, rendered great assistance.

In a few minutes, having passed what may be called the outworks of the range, we fairly entered its gigantic precints, and commenced to thread the mazes of a cañon, far exceeding in vastness any that had been yet traversed. The walls were perpendicular, and more than double the height of those in the Mojave mountains, rising in many places, sheer from the water, for over a thousand feet. The naked rocks presented, in lieu of the brilliant tints that had illuminated the sides of the lower passes, a uniform sombre hue, that added much to the solemn and impressive sublimity of the place. The river was narrow and devious, and each turn disclosed new combinations of colossal and fantastic forms, dimly seen in the dizzy heights overhead, or through the sunless depths of the vista beyond. With every mile the view became more picturesque and imposing, exhibiting the same romantic effects and varied transformations that were displayed in the Mojave canon, but on an enlarged and grander scale.

Rapids were of frequent occurrence, and at every one we were obliged to get out of the skiff and haul it over. Eight miles from the mouth of the canon, a loud sullen roaring betokened that something unusual was ahead, and a rapid appeared which was undoubtedly the same that had been described by Ireteba. Masses of rock filled up the sides of the channel. In the centre, at the foot of the rapid, and rising four or five feet above the surface of the water, was a pyramidal rock, against which the billows dashed as they plunged down from above, and glanced upwards like a water spout.

The torrent was swifter than at any place below, but a steamboat, entirely emptied of its cargo, which could be deposited upon the rocks alongside of the rapid, could, if provided with long and stout lines, be hauled up. During a higher stage of the river the difficulty of the place would be much diminished. With our nearly worn out ropes it would be very hazardous to attempt the ascent.

Several rapids followed at short distances, all of which would be troublesome to pass at the present depth of water. The constant getting out of the boat, and the labour of dragging it through these difficult places, made our progress for some miles exceedingly tedious and fatiguing. As sunset was approaching we came to a nook in the side of the canon, four miles above the roaring rapid, where a patch of gravel and a few pieces of drift wood, lodged upon the rocks, offered a tolerable camping place, and we hauled the skiff upon the shingle and stopped for the night. There was no need of keeping a watch, with two grim lines of sentinels, a thousand feet high, guarding the camp. Even though we could have been seen from the verge of the cliff above, our position was totally inaccessible.

Darkness supervened with surprising suddenness. Pall after pall of shade fell, as it were in clouds, upon the deep recesses about us. The line of light, through the opening above, at last became blurred and indistinct, and save the dull red glare of the camp-fire, all was enveloped in a murky gloom. Soon the narrow belt again brightened, as the rays of the moon reached the summits of the mountains. Gazing far upward upon the edges of the overhanging walls we witnessed the gradual illumination. A few isolated turrets and pinnacles first appeared in strong relief upon the blue band of the heavens. As the silvery light descended, and fell upon the opposite crest of the abyss, strange and uncouth shapes seemed to start out, all sparkling and blinking in the light, and to be peering over at us as we lay watching them from the bottom of the profound chasm. The contrast between the vivid glow above, and the black obscurity beneath formed one of the most striking points in the singular picture. Of the subsequent appearance of things, when the moon rose higher, I do not think any one of our weary party took particular notice.

This morning, as soon as the light permitted, we were again upon the way. The ascent of the river was attended with as much labour as it had been the day before; for though none of the rapids were of so violent a character, they were of constant occurrence. The wind still held to the south, and the blanket sail was again set to great advantage.

The canon continued increasing in size and magnificence. No description can convey an idea of the varied and majestic grandeur of this peerless water-way. Wherever the river makes a turn the entire panorama changes, and one startling novelty after another appears and disappears with bewildering rapidity. Stately façades, august cathedrals, amphitheatres, rotundas, castellated walls, and rows of time-stained ruins, surmounted by every form of tower, minaret, dome, and spire, have been moulded from the cyclopean masses of rock that form the mighty defile. The solitude, the stillness, the subdued light, and the vastness of every surrounding object, produce an impression of awe that ultimately becomes almost painful. As hour after hour passed we began to look anxiously ahead for some sign of an outlet from the range, but the declining day brought only fresh piles of mountains, higher apparently, than any before seen. We had made up our minds to pass another night in the canon, and were searching for a spot large enough to serve as a resting place, when we came into a narrow passage, between two mammoth peaks, that seemed to be nodding to each other across the stream, and unexpectedly found, at the upper end, the termination of the Black canon.

Low hills of gravel intercepted the view, and prevented us from seeing far into the unknown region beyond. A mile above the canon the river swept the base of a high hill, with salient angles, like the bastions of a fort. At the base was a little ravine, which offered a camping place that would be sheltered from observation, and we drew the skiff out of the water, determining not to proceed any further until to-morrow. Leaving the mate to take charge of the boat, the captain and myself ascended the hill which is over a thousand feet high. A scene of barren and desolate confusion was spread before us. We seemed to have reached the focus or culminating point of the volcanic disturbances that have left their traces over the whole region south. In almost every direction were hills and mountains heaped together without any apparent system or order. A small open area intervened between camp and a range to the north, and we could trace the course of the river as it wound towards the east, forming the Great Bend. In the direction of the Mormon road to Utah, which is but twenty miles distant, the country looked less broken, and it was evident that there would be no difficulty in opening a wagon communication between the road and the river. We tried to discover the valley of the Virgin, but could see no indication of any stream coming in from the northwest. The view in that direction was partially obstructed by another summit of Fortification rock.

Not a trace of vegetation could be discovered, but the glaring monotony of the rocks was somewhat relieved by grotesque and fanciful varieties of colouring. The great towers that formed the northern gateway of the canon were striped with crimson and yellow bands; the gravel bluffs bordering the river exhibited brilliant alternations of the same hues, and not far to the east mingled with the gray summits, were two or three hills, altogether of a blood-red colour, that imparted a purely ghastly air to the scene."

(To be concluded.)

A Useful Dog.— — Schenck, at the Farms, has a dog which goes out near the railroad track every night, a few minutes before it is time for the cars, and waits until they pass, then picks up the paper which is thrown off by the expressman, and carries it to his master. He is always on hand at the regular time, and never fails to bring the paper when it is there. Monday night he came back without it, and so confident was Schenck that

it had not been thrown off, that he walked to Rockport, and there learned that another person had been on the route that day, instead of the regular expressman, and had forgotten to throw it off. This same dog used to get the paper by the stage coach, before the cars commenced running, and never missed being at his post when the stage came along.—*Cape Ann Advertiser.*

For "The Friend."

BIOGRAPHICAL SKETCHES

Of Ministers and Elders and other concerned members of the Yearly Meeting of Philadelphia.

ELIZABETH LEVIS.

Elizabeth Reed was born about the year 1694. We have no account of her very early life or the instruction then given her. Whatever the religious instruction she may have received from her earthly parents, it is evident that she was largely cared for in this respect by her Heavenly Father, who, through the visitations of his grace, opened her understanding into the mysteries of his Heavenly Kingdom. She was at the time of her coming to maturity, a member of Kennett Meeting, in Chester County, where in the Tenth month, 1720, she was married to William Levis, a valuable Friend.

Soon after her marriage, she began to be much employed in the service of the church, and in 1734 was appointed an overseer. In the year 1736, a gift in the ministry of the gospel was committed to her, which she exercised to the edification and comfort of the church. She was often engaged in religious labours at home and abroad, and was frequently concerned in visits to the families of Friends, sometimes to all the members of her monthly meeting, sometimes to those only who were negligent in the attendance of religious meetings. In these services she was often joined with her husband's sister, Elizabeth Shipley, who, as Elizabeth Levis had travelled extensively with Jane Fenn, in the work of the ministry. Of some of these family visits they could report, they "found satisfaction" in their labours, "and encouragement" to pursue them.

Elizabeth Levis found her mind much exercised on account of the free use of spirituous liquors, particularly in the time of harvest. She saw so much injury resulting from this practice, that she was constrained to open her mouth, and to employ her pen in opposition to its continuance. Whilst labouring under this concern, she asked her particular friend, Susanna Blundel, what she thought of Friends trading in and using spirituous liquors? Susanna said it had been a burden to her many years. She seemed much affected in consideration of the subject, and added "what can we women do? The men uphold it." This fellow labourer of Elizabeth Levis, died soon after, and leaving this concern as a heavy burden resting on her mind. When Elizabeth heard of her death, she says, "It took hold of my mind with sorrow, at parting with so near a friend, and one concerned for the honour of God. While my mind was thus affected concerning our dear friend, there seemed this voice sounded in my inward ear, 'there is no cause of sorrow, she has done her day's work and has gone to rest.'"

Elizabeth Levis, soon after this, prepared the following essay. "Some friendly advice and cautions, recommended to the serious consideration of the professors of the holy Truth."

"Dear Friends, brethren and sisters:—Feeling the flowing of that love which wishes well to the whole family of mankind, with earnest desires that all may come to the knowledge of the Truth, and be saved, I cannot well omit giving some account of the great exercise which hath fallen to my lot. I have been in deep distress of mind for many days, insomuch that, in the night season, sleep departed from my eyes, until it pleased the Lord to visit my soul in his love, and bring me to see the cause of my exercises. I was then made to say in the secret of my heart, O Lord, require of me what thou wilt—I will obey thee as thou art pleased to enable me. As I thus became resigned to the will of God, he in great mercy redeemed my soul.

"Dear Friends, I have never found any other way to be favoured with true peace, than by submitting to the cross of Christ, and I can say, the Lord never requires any thing of his people, but he gives ability to perform it; 'blessed be his holy name forever.' He is not a hard master, but a rich rewarder of all who faithfully wait upon him and patiently abide under his refining hand in the time of trial. Oh! that the professors of the holy Truth were willing to come to Jesus Christ, who is the Truth and the Life, that he, by the fan of his power might separate the pure from the impure; not only from those gross evils which are accounted scandalous amongst men, but from everything which would obstruct the life of Truth in the heart.

"Dear Friends, there are many snares and hindering things in the concerns of this world; and without due watchfulness, these will be as the little foxes that nip off the tender buddings of truth. Sometimes the Lord, by the light of his Holy Spirit, gives us to see the uncertainty of temporal things, and that our greatest concern ought to be, the well-being of our immortal souls. If we take heed to the pure gift, the heart becomes tender, but it is to be feared that for want of watchfulness, many overlook the visitations, [of Grace,] and thus in them the pure buddings of the Divine life is kept under. It is the work of the enemy to fascinate the mind with the enjoyments of this world, by which he has gained many to the great sorrow of the true mourners in Sion. This comes by neglecting to give diligent heed to the gift of God in the heart, which hath light and power in it, to enable us to discover and avoid the snares of the enemy, and also to see how he works to captivate and enslave our minds with the things of this life, which are so uncertain to us. Because of these things, many exercised minds go bowed down and heavily burdened on their way, often crying to the Lord in the secret of their hearts, that if consistent with his will, he would work by his Holy Spirit, and arouse the careless ones to flee from the wrath to come.

"There is a call in my heart to you, my dear Friends and fellow creatures, that you carefully mind the visitations of the love of God to your souls. I warn the earthly minded that they give due heed to the witness for God in the heart. As this pure gift is attended to, it will remove the clods of the earth, which have too long obstructed the growth of the seed which God hath sown there. For want of this [attention,] it is to be feared some have become so benumbed, as to a right sense of the great end of their creation, that that which ought to be their chief concern, the promotion of the honour of God and the welfare of their immortal souls, has but little place in their minds.

"It is in fear and reverence that I am thus concerned to express myself at this time; and in that love which wishes well to all mankind, I am enabled to bear the censure of those whose hearts are not seasoned by the virtue of Truth. I am concerned to call on the professors of Truth, that we may be still and wait upon God, so that by virtue of the holy gift in the heart, we may be sensible what our works are, and what foundation we are building upon. If, upon a narrow search, we find we are building upon that foundation, of which our Blessed Saviour spoke to Peter,—the Revelation of the will of God, on which the Church of Christ is built, then the Holy Spirit will be to our comfort and consolation. The Lord may try the faith of these, for the fitting them for service in his church, but those who are resting in a mere profession, will certainly suffer loss. My desire is, that none may slight the day of their visitation, until it be over, lest when too late, they may have to say, 'the harvest is past, the summer is ended, and we are not saved.'"

(To be continued.)

Airing the Soil.

Subsoil drainage has for many years been practised by the best agriculturists. It was first introduced solely with the intent of drying wet lands; and for this purpose only, with but few exceptions, is it still used in the United States. But other benefits have been found to follow the introduction of this system. Rain-water possesses fertilizing properties. If it can be induced to filter through, instead of running off over the surface, as in times of heavy rain, the soil is proportionally benefitted and the surface waste checked. Sub-drainage promotes filtration. Another effect, eminently serviceable, takes place—the æration of the soil. Currents of air flow with the currents of water through the drains, and the whole soil, above the drain-pipes, is, to a greater or less degree, permeated with air. In England, the upper extremity of a line of drainage-pipe is often brought to the surface and left open, to allow the air to enter freely. So obvious have been the advantages of this æration that, of latter times, in some places, pipes have been laid specially to promote this subterranean circulation of atmospheric air. The following notice of this system is taken from a recent number of Dr. Lindley's Agricultural Gazette.

"D. Hooibrenk, near Vienna, announced, in 1859, a new system of culture, stated to insure a more vigorous growth than can be induced by other means. This consists in placing in the earth, pipes or air-channels, pierced with holes which permit the air to penetrate throughout the mass of soil traversed by the roots. According to the inventor of this system, its advantages are numerous and important; he points out the following:—

1. The strongest clay soils, under the influence of currents of air transmitted through the pipes, are divided by thousands of small fissures and thus rendered friable, so that roots can easily penetrate them. The depth at which the pipes should be laid depends on the nature and consistence of the soil.

2. After the soil has been ærated by means of the air-pipes, the vegetation of plants growing in it becomes more active, especially in the case of grain crops and vegetables. The roots finding the soil in a finely divided state, penetrate deeper than usual, and are consequently safe from the vicissitudes of temperature which take place near the surface.

3. The looseness produced by the circulation of air in the soil causes a rapid absorption of rain-water, and prevents caking of the surface. On the other hand, during long continued drought, the roots, owing to the great depth to which they have penetrated, are not exposed to the drying effects of the external air, and are enabled to obtain a supply of moisture which they could not do near the surface.

4. The air-pipes passing through sour soil causes the sourness to disappear, so that where only bad herbage previously grew, the finer grasses can be produced. These good effects are more particu-

larly observed in swampy or marshy ground which may thus be changed into fertile soil.

5. The soil being always kept porous by the circulation of the air, can be more easily worked; and from its openness preventing the accumulation of water, cultivation can be commenced earlier in spring.

6. Plants grown on soil thus improved produce a great mass of roots, and consequently being very strong, they require more space. There is therefore no need to sow so thickly as usual; and hence a considerable saving of seed is effected.

7. Manures are much more energetic in their action in soil which is ærated in this way than in that which has not been so treated; the reason of this being, according to Hooibrenk, that the ærated soil is more uniformly moist throughout its thickness, and that being the case, the decomposition of the fertilizing substance is more rapid and uniform."

In short, the inventor of this system states, that double and even triple the produce may be obtained from land so treated. This increase soon repays the expense of laying the air-pipes. He also states that in the culture of the vine, the ripening of the fruit is greatly accelerated and the quality improved. Such assertions could not fail to be received with doubt by many. Careful experiments were therefore made to test their truth, by Fichtner & Son.

The field in which these experiments were conducted, consists of a bed of loam or sandy clay, from 13 to 16 inches deep, resting on a subsoil of rounded pebble-stones, like those in an adjoining brook. On the other side of the field is another brook about six and a half feet lower. This difference of level, taken in connection with the stony subsoil, made it doubtful at first whether the beneficial action of the air-pipes would not be owing to the acting as drains in carrying off surplus water. The field contained more than one and a half acre, and had been in cultivation since 1852, but yielded only indifferent returns, at most, about six for one of seed. The Fichtners placed four air-pipes, at the depth of three feet, across the field. Their internal diameter was nearly two and a half inches. The field thus prepared was divided into a number of beds at right angles to the direction of the air-pipes and extending to the portion of ground not furnished with the apparatus. Of the four pipes first laid down, two were joined by a communication pipe, and the mouth of one of them opened into the ash pit of a furnace, whilst the other extremity terminated in an air-tank, the sides of which were of masonry. The surface of the ground furnished with air-drainage was one half acre and 22 poles. The furnace at the end of the pipe was intended to show that the atmospheric air could reach the fire by passing through the soil. To prove this, the opening at the further extremity of the pipe was completely closed, and also the furnace and ash-pit doors, in such way that no air could reach the fire to support combustion except by passing through the soil, under which the pipe leading to the furnace was buried. The fire however, burned perfectly well throughout the day. To burn ten pounds of wood in 2½ hours, would require 8000 cubic feet of air, and this would have to traverse 108,000 pounds of soil, before it could reach the furnace. A similar circulation, though less active, must take place wherever there is a difference in the temperature of the air in the drains and that of the atmosphere, and from observations that have been made, it has been found that a difference of this kind takes place at least once in twenty four hours. Mr. Jaeger remarks, that wherever a furnace exists, its fire may be usefully employed in fertilizing, by means of air-tubes, the adjoining ground; and that gardeners might thus make good use of their hot-house furnaces for improving borders and other parts of their gardens.

The advantageous action of the atmospheric air in passing through the soil is due to the fact of its losing a portion of its oxygen, and thus giving rise to the formation of a larger portion of carbonic acid. To determine the changes effected in these respects, the Fichtners have analysed the air contained in the tubes. [The atmospheric air contained 21 per cent. of oxygen and 12.80 of carbonic acid;] the air from the tubes 20.08 of oxygen and 35.73 of carbonic acid.

The produce of the ærated soil, even taking into account the effect due to the working of the soil in laying the pipes, was considerably increased during the first and only year in which the results are known; a particular increase was observed in the yield of sugar beet. On the estate of Totis, in Hungary, where similar experiments have been made, very encouraging results have been obtained. —*Abridged from the Journal of the Horticultural Society, Paris*, 1862.

[It will be seen that these experiments in themselves, prove little more than the conviction which exists, in the minds of European cultivators, of the importance of ærating the soil. This conviction is founded on many years experience, derived from the double action of ordinary subsoil drainage; which introduces atmospheric air into the soil, while it is carrying water away.]

For "The Friend."

A TRIBUTE TO DEPARTED WORTH.

Thoughts during Philadelphia Yearly Meeting for 1862.

Once more to the old gathering place we come,
A band of sisters to our solemn feast;
Our swelling ranks in reverent silence wait
No pleasing ordinance, no rite of priest.

The church and her best interests, are the themes,
That claim the outward ear, the inward eye
Of many a bowed and suppliant soul, is turned,
For holy help, to Him, who ruleth them on high.

The mothers of our Israel, in their place,
Give us such counsel as pertaineth most
To our best interests; but one face is gone,
The dear familiar face of her the loved and lost.

By the swift mandate of its God recalled,
The noble soul that laboured for our weal,
No longer now for Zion pleads and prays;
That voice in its rich cadences is still.

Hers was no eloquent and rounded phrase;
No flowery language, pleasing to the ear;
But Truth's directness, glistening many an eye
Stony and cold, with fresh unbidden tear.

So forcible, that strong ones bowed and shook
Beneath the terrors of her gospel hand,
So calm and deep and earnest in its strength,
Yet simple, that a child might understand.

And wielded by a woman's feeble arm,
The spirit's sword cleft the abodes of sin;
Making an opening for the holy law
Of truth and righteousness, to enter in.

To many a darkened, hapless couch of pain,
She was the instrument of hope and peace;
Sent by her Master, in His holy power
To minister unto the mind's disease.

And there are those aroused to better things,
And rescued from their course in ruin's way,
Who, humbly waiting in the light of Christ,
Still live to bless that favoured woman's day.

While to the timid, trembling child of hope,
Longing for way-marks on the desert drear,
Like the fresh breezes, from a land of flowers,
A strength in weakness, came her words of cheer.

She asked no blessing from those dying lips,
She shrank from praise that grateful hearts bestow,
But ever sought the glory of her Lord,
His call to answer, and His will to know.

So moved she in her true appointed sphere,
Erectly standing, like a tower of strength,
Bearing her burdens patiently and well—
The angel of deliverance came at length.

* * * * * * *

My mother! at the right hand of thy God,
Dying with hallelujahs to His praise,
The richest guerdon of thy labours won
Thy Saviour's blessing on thy latter days!

My mother! thou hast welcomed to thy home
Of the redeemed in Christ, the honoured dead,
My second mother; on whose gospel breast
I, child-like, oft refreshed my fainting head.

Aye more, she was the first to wake my soul,
From its deep slumbers, in the courts of death,
Where in a false and treacherous ease it lay,
All idly wasting its immortal breath.

O mothers! in your holy home of light,
Where not the semblance of a shadow lives,
My errors and temptations cause no pang,
And the dear Saviour grace sufficient gives.

My heart rejoices in your high estate,
But mourns the loss of friends so good and true;
Its greenest memories of departed worth,
Its holiest aspirations live with you.

I.

Chester Co., Pa.

From the Leisure Hour.

Ink.

Civilized man has long since become, all over the world, a writing animal. The ancient Greeks and Romans penned their ideas on tablets of wax or brass, or else on films prepared from the Egyptian water-weed papyrus. The Cingalese of to-day remind us of what the Greeks and Romans did long ago—scratching their fantastic but elegant characters on the silicious covering of palm leaves, or, when more than ordinarily luxurious, on thin plates of metal—silver or gold, for instance—as many examples to be found in the Museum of the Royal Asiatic Society amply testify. Now, it stands to reason that engraved writing, as one may term it, must needs be a tedious affair. Having once seen a copper or steel plate engraver at work, the reader will not doubt what we say. Engraved writing might have done very well for a Roman poet of the Augustan age, especially such a poet as Horace, who advised candidates for poetic approbation to keep their manuscripts seven years before trying to find a publisher! and, what is more important as regards the matter we are dealing with, he enjoined the precept *sæpe vertere stylum*, whilst composing the MS. Now, the expression *sæpe vertere stylum*, translated, literally, means to turn the stylus or writing instrument about frequently. Understood as Horace meant the sentence to be understood, it simply means obliteration, erasure; the fact being, that the stylum, or classic writing-tool, was sharp at one end, and armed with a sort of cutting edge at the other. If, then, what an author had written on wax or metal chanced to dissatisfy him, he had only to turn his stylum about—*vertere stylum*—and the words might presently be erased and obliterated; whence also the expression of *tabula rasa*, a deleted table or writing surface.

The Cingalese and some other Asiatic people are in the habit of adopting a peculiar sort of bookbinding, one well adapted to meet the case of books written by the engraved process. The similitude of a Venetian blind will readily convey to the reader an idea of the sort of bookbinding to which allusion is made. In the British Museum, and more particularly in the Museum of the Asiatic Society,

books of this sort may be noted, the material in most cases being palm leaf, not unfrequently, however, metal. The Greeks and Romans do not appear to have adopted this style of book-binding. Tablets amongst them were usually reserved either for first compositions—just after the fashion of slates at the present time—or else, as is our custom at present, for inscriptions designed to be permanent, such as votive tablets, epitaphs, and the like. For book-work, the ancient Greeks and Romans either used papyrus rolls, or else sheets of vellum; as for paper, though it would appear to have been manufactured in China from time immemorial, the Saracens are believed to have first made it known in Europe. Whether of papyrus, or vellum, or paper, the material no longer lends itself to the engraved style of writing; ink becomes a necessity, and black has ever been recognised as the most desirable colour for ink.

Now comes a very important question. What is the best black material out of which to manufacture ink—the best, that is to say, in every respect? Firstly, what black is that which can best resist atmospheric influences, which is most uncongenial to roguery, and which can neither be erased nor expunged, nor chemically obliterated? Now, there can be no question whatever but that, if no other point were arrived at than the ones just detailed, carbon or charcoal, in some form or other, would be the most desirable thing out of which to make black ink. Indian ink is little else than finely powdered charcoal, mingled with gum; and printers' and engravers' ink each owes its blackness to animal charcoal, called ivory black, mingled with thick oil. Now, every librarian knows that printers' ink is proof against every chemical influence: acids will not touch it, neither will alkalis. Printed ink marks may be erased, of course, but that process does not involve destruction of ink, so much as of paper. The stains of writing ink may be usually removed again and again, when distributed over printed matter, leaving the latter untouched. If writing ink contain charcoal in any form, this remark, however, does not hold good. Public librarians know the indelible nature of charcoal ink so well, that they studiously avoid it. The ink, for example, supplied to readers in the British Museum Library is prepared with special reference to its easy extraction by chemical means, if, as often happens, a book should get blotted; hence, it would be highly impolitic for a lawyer to pen any important document in the Library of the British Museum with ink there supplied.

Inks, considered in reference to the mere liquid part of them, or "vehicle," as chemists say, may be divided into oil inks and water inks. He who would like to see with his own eyes what oil ink *resembles*, may study the appearance of printers' ink, or, failing that, of ordinary black house-paint. Ink of this sort works well enough from the point of a brush, and it is not very intractable when a blunt pointed reed pen is in question; but with quill pens it is very difficult to use, and with metallic pens impossible.

All writing inks now used are water inks, because of their ready flowing quality. As the world grows older, writers somehow grow more impetuous, Fancy a Greek or Roman sub-editor tranquilly preparing his copy with oily ink and a camel's hair brush! Nevertheless, had there existed editors and sub-editors in the time of Demosthenes, they would have had to work in that fashion—if, indeed, the modern literary use of paste and scissors had not been invented. Herculaneum—that strange witness which has solved so many doubts bequeathed to us by classic antiquity—Herculaneum has settled affirmatively whether the ancients used oily writing inks. Out of the subterranean vaults of that lava-flooded city came forth to light one day, an inkstand having a small quantity of ink in it, which on examination proved merely a rich oil mingled with lamp black. The lamp black was ground up with oil, as is the custom now followed in making black paint; by remembering which, one can understand the meaning of Demosthenes when he taunts his great rival, Æschines, for having been compelled in his youth, through poverty, to sweep the school, sponge the benches, and *grind the ink*.

A sort of reflection appears to be cast on the boasted progress of mankind in the operative arts, when the fact is brought prominently before us, that manuscripts written before the tenth century have for the most part retained the original blackness of their ink, whilst documents written *since* that period for the most part show indubitable signs of perishing or perishableness, so far as relates to their ink. Many, doubtless, who peruse this need not go beyond their own family records for proof of that here stated. Many a letter penned not more than ten years ago shows unmistakeable signs of perishableness as to its ink. Why is this? How comes it that ancient and mediæval people could manufacture permanent inks, whilst we, with all our boasted chemical resources, so often fail? The answer is plain enough. Fast writing is a desideratum as well as permanence of writing. Now, fast writing involves easy flowing, and easy flowing demands a thin ink. Charcoal may be powdered very fine, and it may be suspended for a time in gum water, or thick material similarly mucilaginous, but it *cannot be dissolved;* and herein lie at once the difficulties of using it, and the permanence of it when used. The liquid modern inks are in point of fact dye-stuffs, and the processes of dyeing were very little understood previously to the tenth century.

It would be an endless task to set about describing the composition of writing inks as at present used: a few general indications must therefore suffice. Japan inks, as they are called, one and all contain charcoal in some form or other. To keep the charcoal in suspension, gum, or other glutinous matter, is present of necessity; whence arises the glazy surface produced by Japan ink. Since the dawn of the steel pen era, Japan inks have been gradually falling into disuse. Almost without exception the freely flowing inks, suitable for steel pens, are mere dye-stuffs. To flow freely is a great boon always; but permanence in some cases is even more indispensable. When permanency is required, let the writer beware of easy flowing inks.

As regards the tribe of fancy inks, the ancients had theirs, as we have ours. The *sacrum encaustum*, for example, was a purple ink, the composition of which was kept a profound secret, and which was only employed by the Roman emperors for signing documents. Death was the penalty for obtaining this ink, or even endeavouring to obtain it, from the vigilant officers in whose custody it was preserved. This edict remained in force from A. D. 470 to 1452; except that in the twelfth century the privilege of using it was extended to members of the imperial family, and in some cases to the great officers of state. Doubtless this ink was no other than the celebrated Tyrian purple extracted from a shell-fish. Green ink was especially reserved for signatures of the guardians of the Greek emperors whilst their wards were minors.

And now a final word or two, and they shall be practical. If ink writing have faded from any cause whatever, let not the possessor despair, even though the writing be totally illegible. Chemical art can frequently restore that faded black by application of proper treatment. No mere routine direction will suffice; the treatment suitable in the case of one faded ink, would be fatal in the case of another. The chemist alone can decide, and to him the full responsibility should be given.

From Evenings at the Microscope.

Insects: Their Ears and Eyes.

A very wide field of observation, and one easily cultivated, is presented by the organs of sense in the insect races, and in particular by those curious jointed threads which proceed from the front or sides of the head, and which are technically called *antennæ*. These may sometimes be confounded with the *palpi*, examples of which organs we have been lately looking at; for in a carnivorous beetle, for instance, both *palpi* and *antennæ* are formed of a number of oblong, polished hard joints, set end to end, like beads on a necklace. And it is probable there may be as much community in the function as in the form of these two sets of appendages, that both are the seats of some very delicate perceptive faculty allied to touch, but of which we cannot, from ignorance, speak very definitely. It is likely, indeed, that sensations of a very variable character are perceived by them, according to their form, the degree of their development, and the habits of the species.

It is not impossible, judging from the very great diversity which we find in the form and structure of these and similar organs in this immense class of beings, compared with the uniformity that prevails in the organs of sense bestowed on ourselves and other vertebrate animals,—that a far wider sphere of perception is open to them than to us. Perhaps conditions that are appreciable to us only by the aid of the most delicate instruments of modern science may be appreciable to their acute faculties, and may govern their instincts and actions. Among such we may mention, conjecturally, the comparative moisture or dryness of the atmosphere, delicate changes in its temperature, in its density, the presence of gaseous exhalations, the proximity of solid bodies indicated by subtile vibrations of the air, the height above the earth at which flight is performed, measured barometrically, the various electrical conditions of the atmosphere; and perhaps many other physical diversities which cannot be classed under sight, sound, smell, taste, or touch, and which may be altogether unappreciable, and therefore altogether inconceivable by us. It is probable, however, that the *antennæ* are the organs in which the sense of *hearing* is specially seated; a conclusion which has long been conjecturally held, and which is confirmed by some observations recently made on the analogous organs in the *crustacea*, which I will allude to more particularly presently.

You may see a considerable diversity of figure and of aspect generally in this tiny weevil, which may be accepted as a representative of a great family of beetles, the *curculionidæ*. The manner of their insertion strikes us at first sight as peculiar, as is in fact the aspect of the whole head. Instead of a thick substantial solid front, with powerful, widely-gaping jaws, such as we saw in the *carabus*, here projects from between the eyes a long rod-like proboscis, as long as the whole animal besides, curving downwards, and carrying at its very extremity a minute mouth, with all the proper apparatus of lips, jaws, and palpi. Moreover, the *antennæ* are planted on the two sides of this beak, about its mid-length; and they are curiously elbowed, each projecting horizontally at a right angle to the beak for a considerable distance, and then with a sharp angle becoming parallel to it for the remainder of their length. So that supposing the

terminal half of the beak to be broken off just behind the insertion of the *antennæ*, the whole would compose the letter T. Now, the first bend of this angle is composed of a single joint, the *scapus*, which is in this family, greatly lengthened; and then the two or three final joints are much thicker than all the others, and are as it were fused together into a large oval knob, called the *club*.

Now, a word or two in explanation of this very singular form of head and head-organs. The larva or grub stage of these insects is destined to be passed in the interior of fruits and seeds; the individual which we have been examining (*Balaninus nucum*) was born one morning in August in the interior of a hazel-nut. Its parent had chosen a suitable nut, just then when it is set for fruit, and as yet green and soft; and had with her proboscis, or rather with her jaws at its tip, as with a gimlet, bored a tiny hole through the yielding shell into the very interior; then turning round and inserting the extremity of her abdomen with its ovipositor, she had shot an egg into this dark cavity. The juices poured forth at the wound soon healed the orifice; the nut grew; and presently the egg became a little white grub. He then rioted in plenty; prolonged his darkling feast

"From night to morn, from morn to dewy eve;"

—'twas all "dewy eve" to him, by the way, for no ray of light saw he, till that prosperous condition of existence was done. No wonder he grew fat; and fat those rogues of nut-weevils always are, as you well know. Well, when the nut fell, in October, the kernel was all gone, completely devoured, and our little highway-robber was ready for his winter sleep: he gnawed a fresh hole through the now hard shell, made his way out, and immediately burrowed into the earth, where he lay till June; then became a pupa, and emerged just what you see him, a long-snouted beetle like his mother, in the beginning of August.

Such is his "short eventful history;" and you now see that the long beak is formed entirely with reference to this economy; it is an auger fitted to bore holes into shell-fruits through their envelopes, for the reception of eggs.

In the tribe of two-winged insects, which we term, *par excellence*, flies (*muscadæ*,) the antennæ are of peculiar structure. The common house-fly shall give us a good example. Here, in front of the head, is a shell-like concavity, divided into two by a central ridge. Just at the summit of this projection are the two antennæ, originating close together, and diverging as they proceed. Each antenna consists of three joints, of which the first is very minute, the second is a reversed cone, and the third, which is large, thick, and ovate, is bent abruptly downwards immediately in front of the concavity. From the upper part of this third joint projects obliquely a stiff bristle or style, which tapers to a fine point. It is densely hairy throughout; and is more beset with longer hairs, on two opposite sides, which decrease regularly in length from the base, making a wide and pointed plume.

Such are a few examples of what are presumed to be the *ears* of insects; let us now turn our attention to their *eyes*. And we can scarcely select a more brilliant, or a larger example, than is presented by this fine dragon-fly (*Æshna*,) which I just now caught as it was hawking to and fro in my garden. How gorgeously beautiful are these two great hemispheres that almost compose the head, each shining with a soft satiny lustre of azure hue, surrounded by olive-green, and marked with undefined black spots, which change their place as you move the insect round!

Each of these hemispheres is a compound eye. I put the insect in the stage-forceps, and bring a low power to bear upon it with reflected light. You see an infinite number of hexagons, of the most accurate symmetry and regularity of arrangement. Into those which are in the centre of the field of view, the eye can penetrate far down, and you perceive that they are tubes; of those which recede from the centre, you discern more and more of the sides; while, by delicate adjustment of the focus, you can see that each tube is not open, but is covered with a convex arch, of some glassy medium polished and transparent as crystal. There are, according to the computations of accurate naturalists, not fewer than 24,000 of these convex lenses in the two eyes of such a large species of dragon-fly as this.

Every one of these 24,000 bodies represents a perfect eye; every one is furnished with all the apparatus and combinations requisite for distinct vision; and there is no doubt that the dragon-fly looks through them all. In order to explain this, I must enter into a little technical explanation of the anatomy of the organs as they have been demonstrated by careful dissection.

The glassy convex plate or facet in front of each hexagon is a *cornea*, or *corneule*, as it has been called. Behind each cornea, instead of a *crystalline lens*, there descends a slender transparent pyramid, whose base is the *cornea*, and whose apex points towards the interior, where it is received and embraced by a translucent cup, answering to the *vitreous humour*. This, in its turn, is surrounded by another cup, formed by the expansion of a nervous filament arising from the ganglion on the extremity of the optic nerve, a short distance from the brain. Each lens-like pyramid, with its vitreous cup and nervous filament, is completely surrounded and isolated by a coat (the *choroid*) of dark pigment, except that there is a minute orifice or *pupil* behind the *cornea*, where the rays of light enter the pyramid, and one at the apex of the latter, where they reach the fibres of the optic nerve.

Each *cornea* is a lens with a perfect magnifying power, as has been proved by separating the entire compound eye by maceration, and then drying it, flattened out by pressure, on a slip of glass. When this preparation was placed under the microscope, on any small object, as the points of a forceps, being interposed between the mirror and the stage, its image was distinctly seen, on a proper adjustment of the focus of the microscope, in every one of the lenses whose line of axis admitted of it. The focus of each cornea has been ascertained by similar experiments to be exactly equal to the length of the pyramid behind it, so that the image produced by the rays of light proceeding from any external object, and refracted by the convex cornea, will fall accurately upon the sensitive termination of the optic-nerve filament there placed to receive it.

The rays which pass through the several pyramids are prevented from mingling with each other by the isolating sheath of dark pigment; and no rays, except those which pass along the axis of each pyramid, can reach the optic nerve; all the rest being absorbed in the pigment of the sides. Hence it is evident, that as no two corneæ on the rounded surface of the compound eye can have the same axis, no two can transmit a ray of light from the very same point of any object looked at; while, as each of the composite eyes is immoveable, except as the whole head moves, the combined action of the whole 24,000 lenses can present to the sensorium but the idea of a single, undistorted, unconfused object, probably on somewhat of the same principle by which the convergence of the rays of light entering our two eyes gives us but a single stereoscopic picture.

The soft blue colour of this dragon-fly's eyes—as also the rich golden reflections seen on the eyes of other insects, as the whameflies, and many other *diptera*—is not produced by the pigment which I have alluded to, but is a prismatic reflection from the *cornea*.

You would suppose that, having 24,000 eyes, the dragon-fly was pretty well furnished with organs of vision, and surely would need no more; but you would be mistaken. It has three other eyes of quite another character.

If you look at the commissure or line of junction of the two compound eyes on the summit of the head, you will see, just in front of the point where they separate and their front outlines diverge, a minute crescent-shaped cushion of a pale-green colour, at each angle of which is a minute *antenna*. Close to the base of each *antenna* there is set in the black skin of the head that divides the green crescent from the compound eyes, a globose, polished knob of crystal-like substance, much like the "bull's-eyes" or hemispheres of solid glass that are set in a ship's deck to enlighten the side-cabins. On the front side of the crescentic cushion there is a third similar glassy sphere, but much larger than the two lateral ones. What are these three spherules?

They are eyes, in no important respect differing from the individuals which compose the compound masses, except that they are isolated. The shining glassy hemisphere is a cornea of hard transparent substance, behind which is situated a spherical lens, lodged in a kind of cup formed by an expansion of the optic nerve, and which is surrounded by a coloured pigment-layer.

You may study these simple eyes, or *stemmata* as they are called, in many other insects, though they are not so universally present as the compound eyes. On the forehead of the honey-bee they are well seen, as three black shining globules, placed, as in the dragon-fly, in a triangle.

Importance of Swallows.—As a proof of the valuable services rendered by swallows, it is estimated that one of these birds will devour 900 insects in a day; and when it is considered that some insects produce as many as nine generations in a summer, the state of the air but for these birds may be readily conceived. One kind of insect alone might produce 560,970,489,000,000 of its race in a single year.

Plant an Apple Orchard.—The old ones are fast dying out all through the older States. They were planted a hundred years ago, or more, have done good service, and ought to have their day. When apples are $3 a barrel and upward, there is not an adequate supply in the country. They can be grown at a dollar a barrel with profit. The apple crop in a single small county in this State was worth half a million of dollars last year. Other counties, in the older parts of the Eastern States, were under the necessity of paying out a hundred thousand dollars for this fruit, because they had not the article at home. Peaches and plums we may be able to get along without, but apples we must have—for sauce, for pies, for the desert, and for the dinner-basket of little boys and girls who cannot come home from school to dine. We say, then, to every farmer, plant an orchard of at least a hundred trees. The trees are all ready for you in the nursery, well grown, and grafted two or three years from the bud. Get thrifty trees of varieties that you know will flourish in your locality, and in four years you will be eating fruit from them. Do not fail to plant an orchard.—*Am. Ag.*

THE FRIEND.

SIXTH MONTH 21, 1862.

It is long since we have said any thing to our readers relative to the aid they might give towards rendering the columns of "The Friend" attractive and instructive. The season of the year now invites many from their homes in the city to others in the country, and the absence of city associations and habits, affords more time for reading and writing, and a corresponding opportunity for preparing essays and making selections. There are many of our country friends who have occasionally favoured us with original and valuable communications, but who allow such contributions to be too few and far between, to meet our wishes, or satisfy the desires of our readers. To both classes referred to, we would extend a word of encouragement, if we may not prefer *a claim*, to make use of this journal as the means for disseminating their views and feelings, or imparting to others such portions of what they read, as they think particularly worthy of note. We believe there are many who feel a strong interest in the welfare of our religious Society, and who sometimes think they would be willing to do or to suffer much to promote its well-fare, and increase the faithfulness and stability of its members; and perhaps, if some great thing were required of them, they would engage in it with alacrity; but are they sufficiently diligent to embrace the opportunities that do present, for employing the time and talents bestowed upon them to the best advantage, and to avail themselves of the opportunities presented, in which they might do something, if it be only a little, for the benefit of their fellow members and the promotion of the great and good cause of truth and righteousness? This query seems naturally to arise in connection with the consideration of means for diffusing a knowledge of the doctrines and testimonies of our society, pointing out their application to the events of the day, and essaying to preserve or establish the members in an upright maintenance of them. One of those means is a periodical like The Friend, which is weekly welcomed in so many families connected with the society, where its contents, it may be presumed, are perused with attention and interest. It is not necessary to say much upon this subject, our wish being only to remind our readers of the opportunity thus afforded for the useful employment of part of their time, and of the welcome we would give to all contributions, whether original or selected, which would assist in making our journal the religious and literary miscellany it is designed to be.

SUMMARY OF EVENTS.

FOREIGN.—News from England to the 7th inst. The British Government, at the request of the Atlantic Telegraph Company, have ordered two steamers to be got ready for the purpose of making a further survey on both sides of the Atlantic. A general agitation has commenced in East Lancashire, to induce the government to remove all duties from cotton goods imported to India, and thereby relieve the distress of the manufacturing districts. A large district out door meeting has been called to discuss the question. A vessel has arrived at Liverpool from Charleston, S. C., with a cargo of rosin and turpentine. The ship Antoinette had left Liverpool for New Orleans with a cargo of salt. Other vessels were soon to follow. The stock of cotton in the Liverpool market was much reduced, and prices had further advanced. Breadstuffs dull.

The Paris *Moniteur* publishes an imperial decision reducing the French army in Rome to a single division, under the command of Gen. Montebello. Accounts from the manufacturing districts of France are more favourable, and the silk and other crops promising. The Mexican ports of Tampico and Alvarado have been declared under blockade.

The Turks have obtained important advantages in the war with the Montenegrins, a number of whom had been killed in battle, and several of their villages destroyed by fire.

The latest news from China states that the rebels had been twice defeated with great loss.

The news from Mexico is to the 1st inst., and confirms the defeat of the French troops by the Mexicans. Five hundred of the former were killed, and 900 taken prisoners, but the latter were released, as the victors had not food for them. The Mexicans were actively fortifying the capital, and the French will march against it when reinforcements arrive.

UNITED STATES.—*Virginia.*—There has been little information during the past week, respecting the movements of the hostile armies near Richmond. On the one hand, it is asserted that M'Clellan's army is gaining steadily in position and strength each day, and that the capture of Richmond is merely a question of time, while on the other hand, the rebels represent everything as progressing favourably for their cause, and express the utmost confidence that the Federal army will be signally foiled in the attempt. On the 14th, large bodies of the rebel troops were observed to be moving toward the late battle field, as if for the purpose of making another attack. Frequent skirmishes, attended with loss of life, were occurring between the two armies. Several severe engagements have taken place in the Shenandoah valley, between the rebel forces commanded by Gen. Jackson, and the troops of Fremont and Shields. In one which occurred on the 8th inst. near Harrisonburg, Rockingham County, the rebels appear to have been defeated, and continued their retreat southward. On the next day another battle occurred at Port Republic, in which the Federal forces were repulsed. The number of killed and wounded on both sides is understood to be quite large. It is reported that Jackson's forces have been reinforced, and that he will now be able to assume the offensive. Trade in Norfolk is reviving, and the Union feeling, which had been at a low ebb, is understood to be steadily increasing.

North Carolina.—There is but little news in this department. Gen. Burnside recently visited Washington, for the purpose of giving information and receiving instructions. He came through the Albemarle and Chesapeake Canal, in the gun boat Port Royal.

South Carolina.—The Federal forces have taken possession of Stono Inlet, having captured all the batteries upon it, and advanced within five miles of Charleston. The rebel army at Charleston has been greatly augmented. Deserters say that 30,000 men from Beauregard's army had reached there, and preparations had been made for a stubborn defence. Com. Dupont did not think the attack could be successfully made with his present force.

Missouri.—Governor Gamble, by a special message to the State Convention, has called the attention of the members to the fact that the President of the United States, in a message sent to Congress during the present session, had proposed the adoption of a joint resolution declaring the willingness of Congress to furnish aid to such of the Slave States as may think proper to adopt a measure of emancipation, and that such a resolution had been adopted by both Houses of Congress. The Governor considers the proposition an eminently liberal one, and suggests that it is entitled to a respectful answer in express language. The Governor's message was referred to a special committee.

Tennessee.—The inhabitants of Memphis have submitted quietly to the rule of the United States authorities. Applications had been made for the shipment of 6,000 bales of cotton. About 30,000 bales were burned there before the surrender. Many of the citizens who fled on the approach of the Federal fleet, have returned to their homes. The Mayor and City Councils were acting in harmony with the military rule. No military operations are reported since the capture of Memphis and Chattanooga.

Mississippi.—The health of Gen. Halleck's army is said to be good, notwithstanding the oppressive heat of the summer. A large force is at work repairing the railroad and the bridges between Memphis and Corinth, and as soon as this is done the latter place will be made the base of operations for the U. S. army of the southwest. Gen. Beauregard remained with the rebel army at the date of the last dispatches. Gen. Pope had advanced as far southward as Okolona, seventy miles from Corinth, the rebels continuing their retreat. The latest despatches from Gen. Halleck, state that Beauregard's army was still in the vicinity of Okolona, Overton and Columbus, Miss. Deserters from the rebel army represent it to be greatly disorganized, and portions of it mutinous. The rebel army has stripped of food the whole country south of Corinth, leaving many of the inhabitants in a starving condition. The reported surrender of Vicksburg was premature. Com. Farragut's fleet had passed the city, but was compelled to fall down the river on account of the low water.

Louisiana.—The health of New Orleans was generally good up to the 1st inst. The cane plantations below the city looked exceedingly well, their proprietors not paying much heed to the suggestions of the rebel leaders. The pilots and tow boats had resumed their former vocations at the Southwest Pass. Provisions, which were greatly needed, appear to be coming in pretty freely up the river. The tone of the New Orleans papers indicates a steady increase of loyalty to the Union. The *Delta* has changed its editors, and is now a strong Union paper; the *Picayune* and *True Delta*, utter neither loyal nor disloyal sentiments, but counsel peaceful submission. Recruiting for the U. S. army was progressing in New Orleans with tolerable success, though all the impediments that could safely be thrown in the way were resorted to.

New York.—Mortality last week, 335; 151 adults and 184 children. The money market continues easy, at 3½ a 4 per cent. on call, and 4 a 5 per cent. for discounts on prime paper. American gold, 6½ a 6¾ per cent. premium; gold bars, 7⅛ a 7⅜ premium.

Philadelphia.—Mortality last week, 207. The following were the quotations in the grain market on the 16th inst. Fair and prime red wheat, $1.24 a $1.28; white wheat, $1.32 a $1.35; rye, 67 cts; prime yellow corn, 52 cts. a 53 cts.; Pennsylvania oats, 40 cts.

The Freed Slaves.—The Danish Government has made a formal proposition, through its Minister, to take all the negroes who have escaped from their masters, and remove them to St. Croix free of charge. It then proposes to put them under an apprenticeship of three years; permitting them to receive regular wages. At the expiration of their apprenticeship, it is proposed to free them unconditionally. The U. S. Secretary of State has submitted copies of the correspondence to the chairman of the Judiciary Committee in each House of Congress. Another ship load of contrabands will soon leave for Hayti, making in all about 500, during the past month to that country. Gen. Hunter's coloured regiment at Beaufort, S. C., is now uniformed, and numbers 1000 men.

The Suez Canal.—The annual meeting of the shareholders of the Suez Canal Company assembled lately in Paris, and the report contains several interesting facts. The chief engineer entertains no doubt but that the waters of the Red Sea will be united with the Mediterranean in the course of about eight months. There are at present 26,000 Arabs employed on the work.

Commerce with Liberia.—The bark Justina sailed recently from Baltimore with goods and emigrants for Liberia, and the bark Ocean Eagle from New York, with a cargo valued at $40,000. The latter vessel took out four sugar mills, ordered by the Liberian authorities. These movements show the importance of the bill lately passed by Congress, for the establishment of diplomatic relations with the young African Republic. An emigrant to Liberia, is not only taken out by the Colonization Society free of expense, but is provided with house room and support, without charge, for six months, or until he can prepare his land, which is given him by government.

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Application for the Admission of Patients may be made to the Superintendent, to CHARLES ELLIS, Clerk of the Board of Managers, No. 724 Market Street, Philadelphia, or to any other Member of the Board.

NOTICE.

An active young man, a member of our Society, wants a situation in a wholesale store; he has some knowledge of book-keeping, and is a good penman. Inquire at the office of "The Friend."

DIED, on the 18th of Fifth month, 1862, at his residence, near Moorestown, N. J., aged sixty-one years, DANIEL WOOLMAN, of a lingering illness, which he bore with much patience and resignation to the Divine will. For the last year a member of Chester Monthly Meeting of Friends, N. J., but formerly a member of Frankford Monthly Meeting, Pennsylvania.

PILE & M'ELROY, PRINTERS,

Lodge street, opposite the Pennsylvania Bank.